PORTOPIA

Ports Observatory for Performance Indicator Analysis

July 2014

Prof. dr. Michaël Dooms (michael.dooms@vub.ac.be) - Coordinator

July 2014

SEVENTH FRAMEWORK PROGRAMME

PORTOPIA

The project and the consortium

PORTS OBSERVATORY FOR PERFORMANCE INDICATORS ANALYSIS

• 12 partner consortium, led by University of Brussels (VUB) – Department of Business

• Consisting of universities, research institutes and industrial partners with a proven track record

• Project duration: 4 years – started September 2013

• www.portopia.eu

• Partners:

PORTOPIA

The project and its other associated industry partners

History

- Green paper 1997
- Failures of Port Packages 2001 & 2006 ('hard approach')
- Communication on Ports (2007) ('soft approach')
  - Modernization chapter: need for indicators showing long-term trends in the industry's performance (policy-driven)
- 2009: call for projects through grant agreement
  - PPRISM (2010-2011) as an answer, led by ESPO
  - Conclusion: need for technological development (user-friendliness, data security) and further indicator development at the service of ports and their stakeholders
  - Result: 2012 FP7 call
- 2013: PORTOPIA (FP7 project gathering industry and academic partners) = game changer: R&D innovation driven instead of policy driven (so individual ports need to benefit first)

PORTOPIA

Introduction – what came before

- PPRISM project (2010-2011) pprism.espo.be (300k €)
- First approach to collect data on port performance in different perspectives
- 58 ports participating (2 surveys)
- European Port Performance Dashboard – 14 indicators
- Need for investment in ICT for a more efficient data collection / better user interface
- Need to integrate other stakeholders
- FP7 call in July 2012
- PORTOPIA started September 1st, 2013

European Port Performance Dashboard

Port authorities and port community stakeholders take pride in the important contribution seaports deliver to European trade and welfare. But is anyone outside the industry aware of this? ESPO seeks to contribute to public policy in the EU to achieve a safe, efficient and environmentally sustainable European port sector, operating as a key element for the competitiveness of European companies. In this context, ESPO increasingly needs to demonstrate the performance of the sector in terms of delivering the expectations of an ever-widening range of stakeholders who seek evidence of achievements.

ESPO has taken a first step in establishing a culture of performance measurement in European ports with the two year PPRISM project (Port PeRformance Indicators: Selection and Measurement), co-funded by the European Commission that has delivered a shortlist of indicators that form the basis of the first European Port Performance Dashboard.

ESPO acknowledges with grateful thanks the expert advice of its members related to data input and evaluation, and to its PPRISM academic partners for dedicated research support. The European Commission is thanked for its encouraging cooperation and financial support.

How can port authorities contribute?

Port authorities can contribute directly by participating in the next round of data collection. A user friendly interface is being developed to facilitate data reporting.

Effective and influential representation of the sector at all levels requires credible measures of performance based on a wide sample of member ports. ESPO encourages its members to develop and support the culture of monitoring and reporting of the proposed performance Indicators.

Benefits of participation to the port authority:

» Gain recognition as having contributed to the dashboard (data provided is kept strictly confidential and the dashboard is only populated with aggregated results at European level)
» Assist ESPO in contributing to EU policy and obtain initiative with stakeholders
» Performance data for the dashboard are of direct use for the port's overall management programmes and self-assessment

The dashboard is a support tool to assist ESPO members and help the sector.

Contact & Support
Requests for further information or clarification about the Dashboard can be obtained from ESPO (pprism@espo.be). PPRISM results are available at http://pprism.espo.be/

EU port authorities converge towards the 'facilitator' type

Over the last years, port governance issues have become increasingly relevant. The changing economic and political environment has led to changes in port governance structures. There is still an ongoing debate regarding appropriate port governance models. Thus, it is relevant to identify and monitor particular aspects of the governance models in place and their impact on performance.

Since the 1970s, ESPO and its predecessor the Community Port Working Group have been producing a series of "Fact-Finding" reports which aim to provide insight in the way in which European ports are governed. Throughout the years these reports have become leading reference tools both for port practitioners and policy makers at all levels. In 2011, ESPO published a new version of its 'Fact Finding Report' on port governance based on an extensive survey amongst ESPO members.
The governance section of the PPRISM project draws on this latest report and attempts to develop and measure a number of port governance indicators. These can be interpreted on a stand-alone basis. In addition, analysis of the relation between the port governance indicators and other port performance indicators may provide meaningful insights. The governance indicators reported in the dashboard touch upon basic functions of port authorities through an evaluation of a number of relative criteria on a binary (True, False) basis.
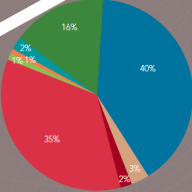
» Autonomous Management provides information on whether port authorities maintain features that enable it to develop vital initiatives.
» The indicator Integration of Port Cluster expresses the extent to which port authorities act towards the integration of various stakeholders composing a port cluster.
» Reporting Corporate and Social Responsibility touches upon port authority's activities that enhance corporate responsibility.

PPRISM Governance indicators results 2010

Explanatory Notes:
• On average, European PAs fulfill 7 out of 10 criteria of the IPC indicator (n=53).
• On average, European PAs fulfilled 7.85 out of 10 criteria of the AM indicator (n=54).
• On average the PA fulfilled 7.5 out of the 10 criteria under question for the RCSR indicator (n=52).

Snapshot of the EU Port System

Ownership of port authorities

State
Region
Province
Municipality
Private (industry)
Private (logistics)
Private (finance)
Other

Economic objectives of port authorities

Maximisation of handled tonnage
Maximisation of added value
Maximisation of the profits of the companies active in the port
Maximisation of the profit of the port authority
Other

Source: ESPO Fact Finding Report 2011

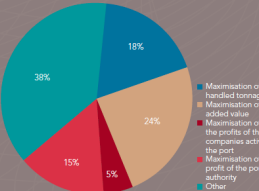### Involvement of PA in actions and initiatives that benefit the entire port community

Assist and facilitate port community with implementation of regulations
Invest in hinterland networks outside port borders
Operate port community IT system (where applicable)
Lead overal promotion and marketing of the port
Provide training and educational programmes for the port community
Manage and promote cruise traffic (where applicable)

■ Yes ■ No

Direct provision of operational services

Pilotage outside the port area
Pilotage inside the port area
Towage outside the port area
Towage inside the port area
Mooring
Dredging outside the port area
Dredging inside the port area
Provision of water
Provision of electricity (general)
Provision of shore-side electricity to ships
Provision of waste reception facilities to ships
Cargo handling on board ship
Cargo handling ship-shore
Cargo handling shore-inland transport
Warehousing services
Passenger services
Road haulage
Rail operation
Inland barging

■ Port authority ■ Government ■ Private Operator ■ Other ■ Not applicable

FP7 – SST.2013.6-2

- **Title of the call:** *"Towards a competitive and resource efficient port transport system"*

- Collaborative Research Project (CP) – 48 months

- **Main objective:**

  – *"to develop a ports observatory with a set of indicators measuring EU ports performance, activities and developments"*
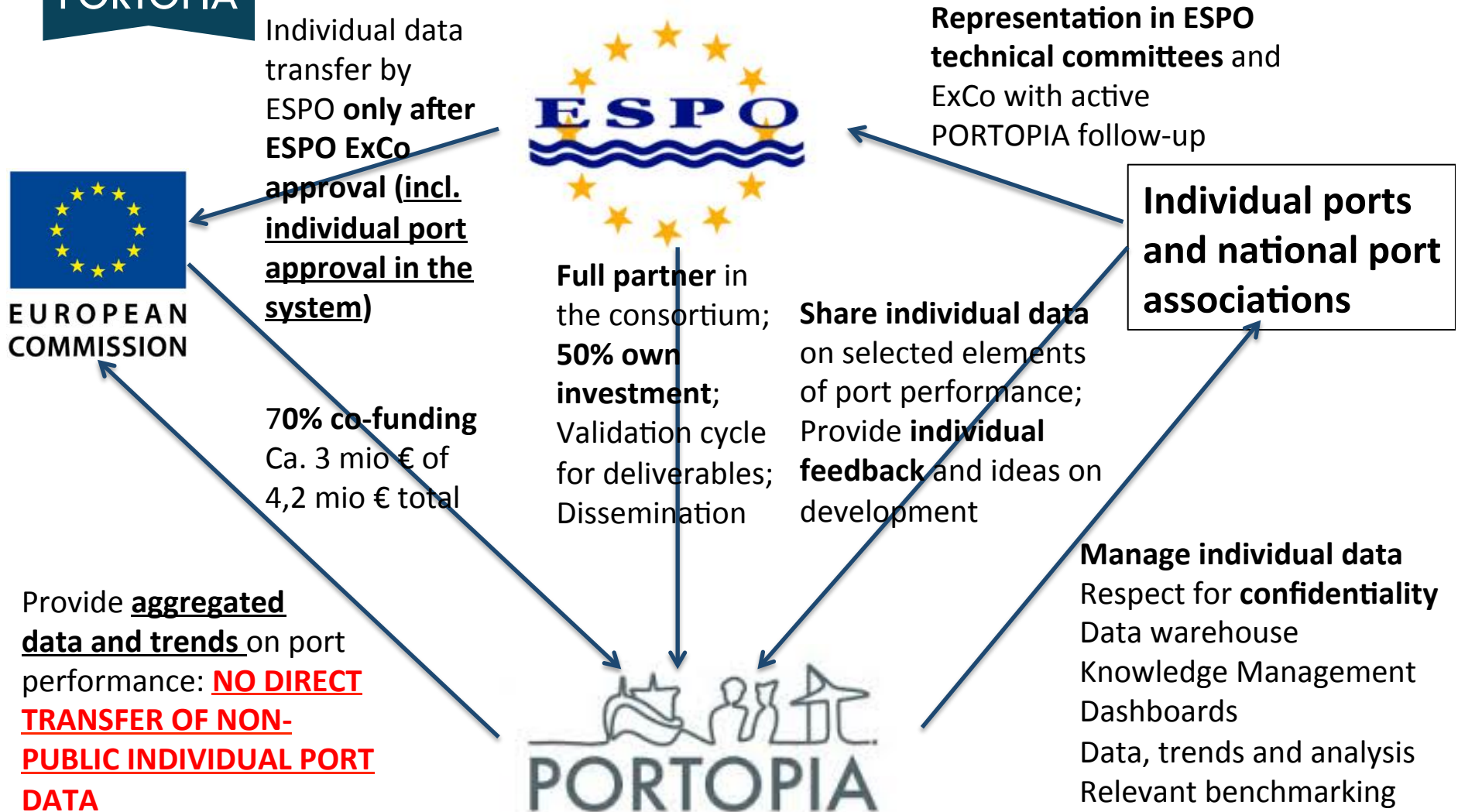
What is FP7?

- FP7 (now replaced by the horizon 2020 funding scheme) is the one of the largest R&D and innovation funding schemes in the world (80 billion € between 2014-2010)

- R&D projects under the FP7 scheme are:
  - Collaborations between scientific institutes and industry
  - Co-funded (50 to 70%) to guarantee industrial commitment and application
  - Contributing to sustainable economic development: creation of new products and services is an essential element (valorization is key)

- E.g. development of new lighting solutions (less energy); development of green cars; innovative healthcare solutions ; etc. etc.

- Ports/maritime industry has historically been absent within this funding scheme (in contrast to rail, air and road transport who all have developed an R&D and innovation agenda)

Relation between PORTOPIA, the ports and the European Commission (DG MOVE)

Individual data transfer by ESPO **only after ESPO ExCo approval (incl. individual port approval in the system)**

Representation in ESPO technical committees and ExCo with active PORTOPIA follow-up

Individual ports and national port associations

Full partner in the consortium; **50% own investment**; Validation cycle for deliverables; Dissemination

Share individual data on selected elements of port performance; Provide **individual feedback** and ideas on development

70% co-funding Ca. 3 mio € of 4,2 mio € total

Provide **aggregated data and trends** on port performance: **NO DIRECT TRANSFER OF NON-PUBLIC INDIVIDUAL PORT DATA**

Manage individual data Respect for **confidentiality** Data warehouse Knowledge Management Dashboards Data, trends and analysis Relevant benchmarking

12 partner independent consortium bound by a Description of Work and a Consortium Agreement; **Investment** by consortium partners **1,2 mio €**

PORTOPIA: 10 Strategic Objectives

Strategic Objective	Description
1	Identify *extensions and elaborations of currently used indicators* within various existing / completed / ongoing projects and initiatives
2	*Integrate inland ports* in the observatory
3	*Develop a benchmarking tool* that allows *individual ports* to compare their activities and operations *with the EU average* and with **ports in other important regions** like Asia and the Americas *in a meaningful way*
4	*Ensure a balanced representation of ports* and port actors across the EU and relevant neighbouring countries (e.g. Mediterranean Partner Countries)
5	*Develop an approach to collect data from the whole port community*: this entails the implementation of appropriate mechanisms to collect, manage and distribute the data on a long term and to show trends over a substantial timeline

PORTOPIA: 10 Strategic Objectives

Strategic Objective	Description
6	*Implement a user-friendly interface*
7	*Determine appropriate weighting and aggregation levels* leading to comprehensiveness and meaningfulness of port system indicators
8	*Develop a knowledge and management tool* for monitoring the efficiency and performance of sea and inland ports
9	*Ensure stakeholder confidentiality* of data management
10	*Develop and implement a business case for a European Port Observatory (EPO)* to ensure sustainable continuity (long term data monitoring and trends)

Source: PORTOPIA consortium (2012), reinterpretation of the call text

PORTOPIA

Mission Statement

PORTOPIA will deliver a sustainable, self-supporting European Port Performance Management Cloud Service, validated and endorsed by port industry stakeholders, that provides added value to the industry and its stakeholders by supplying transparent, useful and robust indicators and the contextual analysis thereof, leading to improved resource efficiency, effectiveness and societal support for the European Port System

PORTOPIA

PORTOPIA's outputs

- The ambition of PORTOPIA is to develop a dynamic, **user-friendly port performance management cloud service** where stakeholders (port authorities, operators, service providers, worker associations, etc.) can administer their own data in a **secured, individual** space.
  - o Cloud service for learning and self-improvement
  - o Meaningful indicators (link to policy / strategy)
  - o Contextualization of indicators within larger tendencies
- Intelligent **benchmarking tool**
  - o Against peer group, EU average, best performer and global benchmarking
  - o Including best practices of the best performer
  - o Individual port data kept confidential
- **Reports and publications** for cloud service contributors, users and stakeholders

Examples from other industries

How Airports Measure Customer Service Performance

Sponsored by the Federal Aviation Administration

2013 ATRS Global Airport Performance Benchmarking Project

Key Findings

Prof. Tae Hoon Oum, Dr. Yap Yin Choo, Prof. Chunyan Yu

ATRS Global Airport Benchmarking Task Force:
Asia Pacific: P. Forsyth, Xiaowen Fu, Yeong-Heok Lee, Yuichiro Yoshida, Japhet Law, Shinya Hanaoka
Europe: Nicole Adler, Jaap de Wit, Hans-Martin Niemeier, Eric Pels
North America: Tae Oum, Bijan Vasigh, Jia Yan, Chunyan Yu
Middle East: Paul Hooper

Railenergy toolkit

ASQ The World Leader in Airport Service Benchmarking

InteGRail
INTElligent inteGration of RAILway systems

What after the project?

- The end objective of the project is to deliver a self-supporting structure, under supervision/management of the industry

- Three high-level scenario's:
  - (1) Internalization within ESPO
  - (2) Creation of a new npo with participation of ESPO, academic partners, other industry and selected stakeholders
  - (3) Set-up of a private, commercial company with board representation of the industry (e.g. ESPO)

- Each scenario has different legal & financial consequences

- *"If well organized, the system can largely be free of charge for participating ports"*

Concrete outputs (May 2014)

- Data integration / data cubes
  - All previous data stored in one place, and accessible
  - Led to individual 'Port Profile' (= "identikit" of port)
  - http://cloud.portopia.eu
- CEF project pipeline tool (investment needs)
- Rapid exchange system 'new style'
  - View the demo video on the website
  - https://www.youtube.com/watch?v=OMnj5-C2EXE
- Efficient interface for data collection
  - Avoid redundancies in data collection, improve quality

PORTOPIA Cloud Service (1)

Login
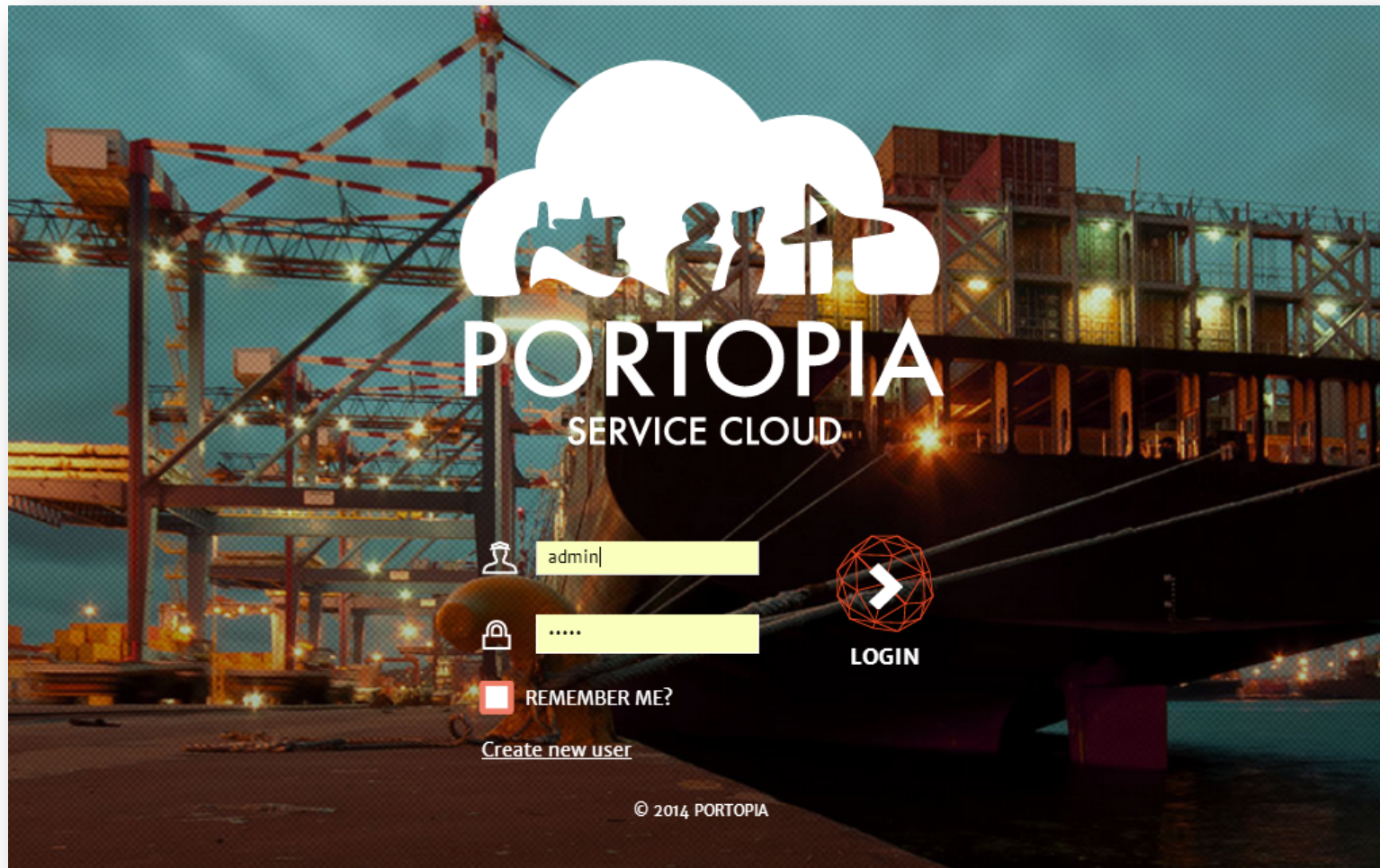
PORTOPIA Cloud Service (2)

The desktop overview

PORTOPIA Cloud Service (3)

Desktop Menu (Expanded)
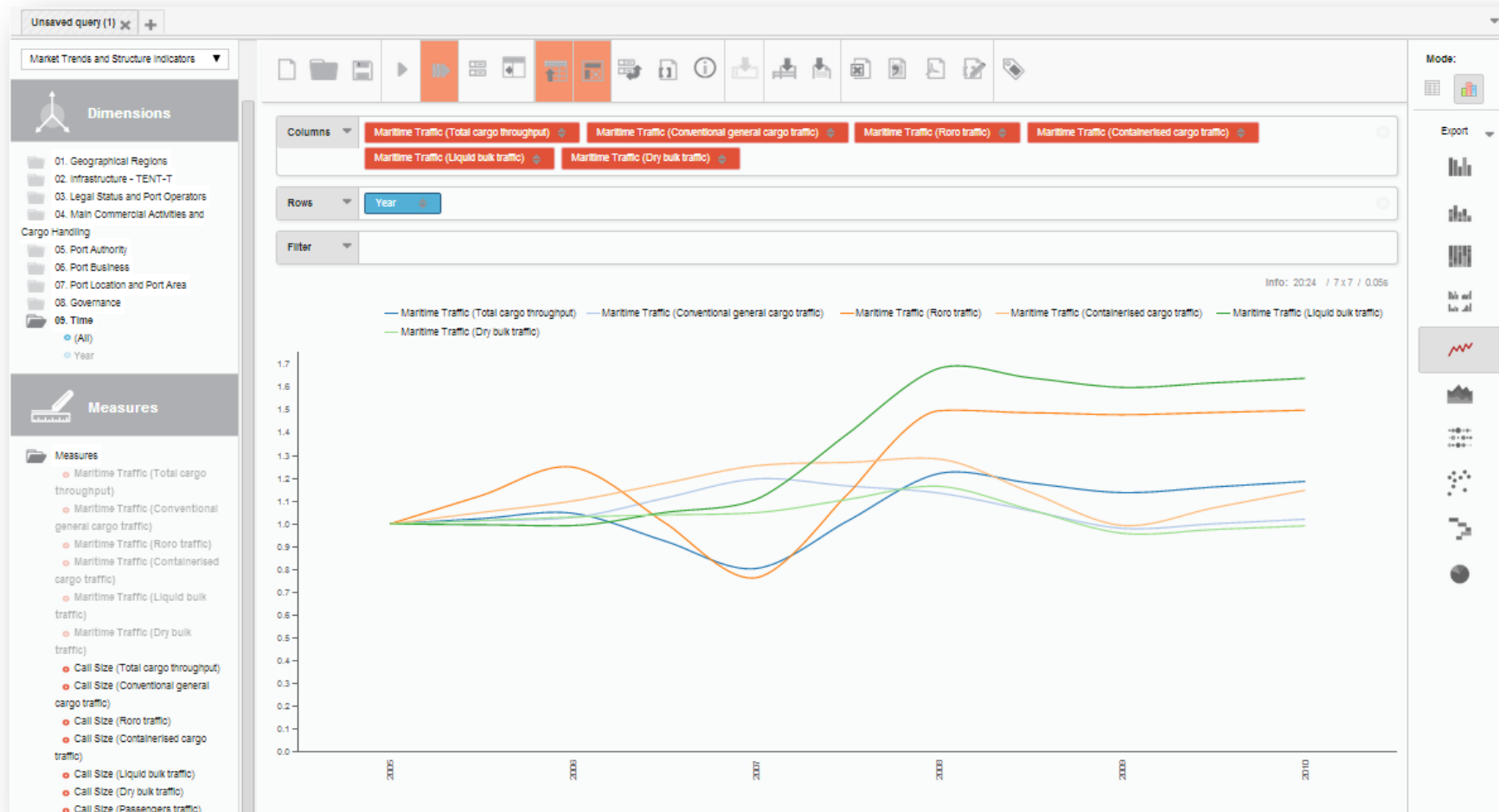
DATA ANALYSIS MODULE

Overview

The approach:

✓ The Data Analysis Module is being developed following the guidelines: to be as user-friendly as possible, intuitive, easy for the novice user, and flexible enough to accommodate experts.

The interface proposes to be able to give a:

✓ Clear understanding of data

✓ Different perspectives of Ports aggregated data

✓ Fast and easy to access to data aggregations

✓ Organized data

✓ Easy Data "navigation" (being able to navigate through different hierarchic dimensions)

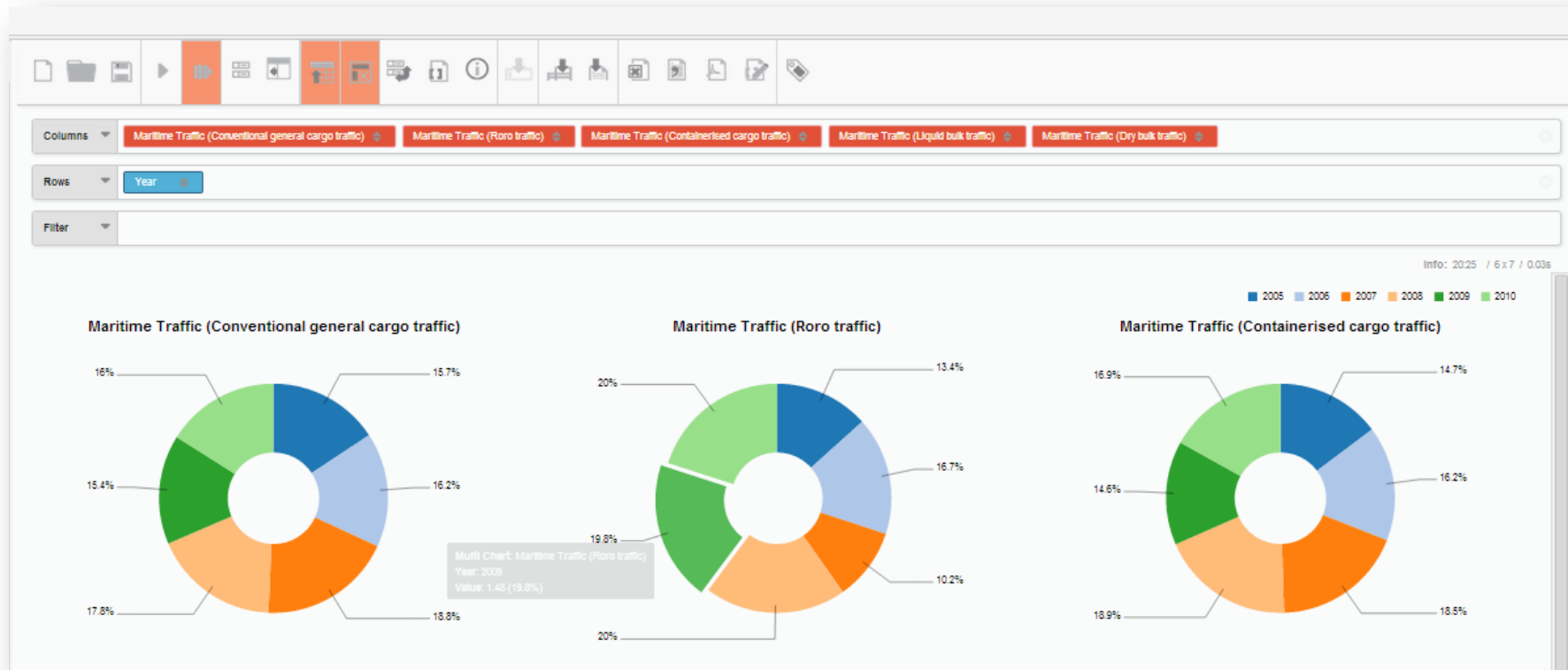✓ Evolution to trend analysis, forecasting, drill-down capabilities, etc.

DATA ANALYSIS MODULE
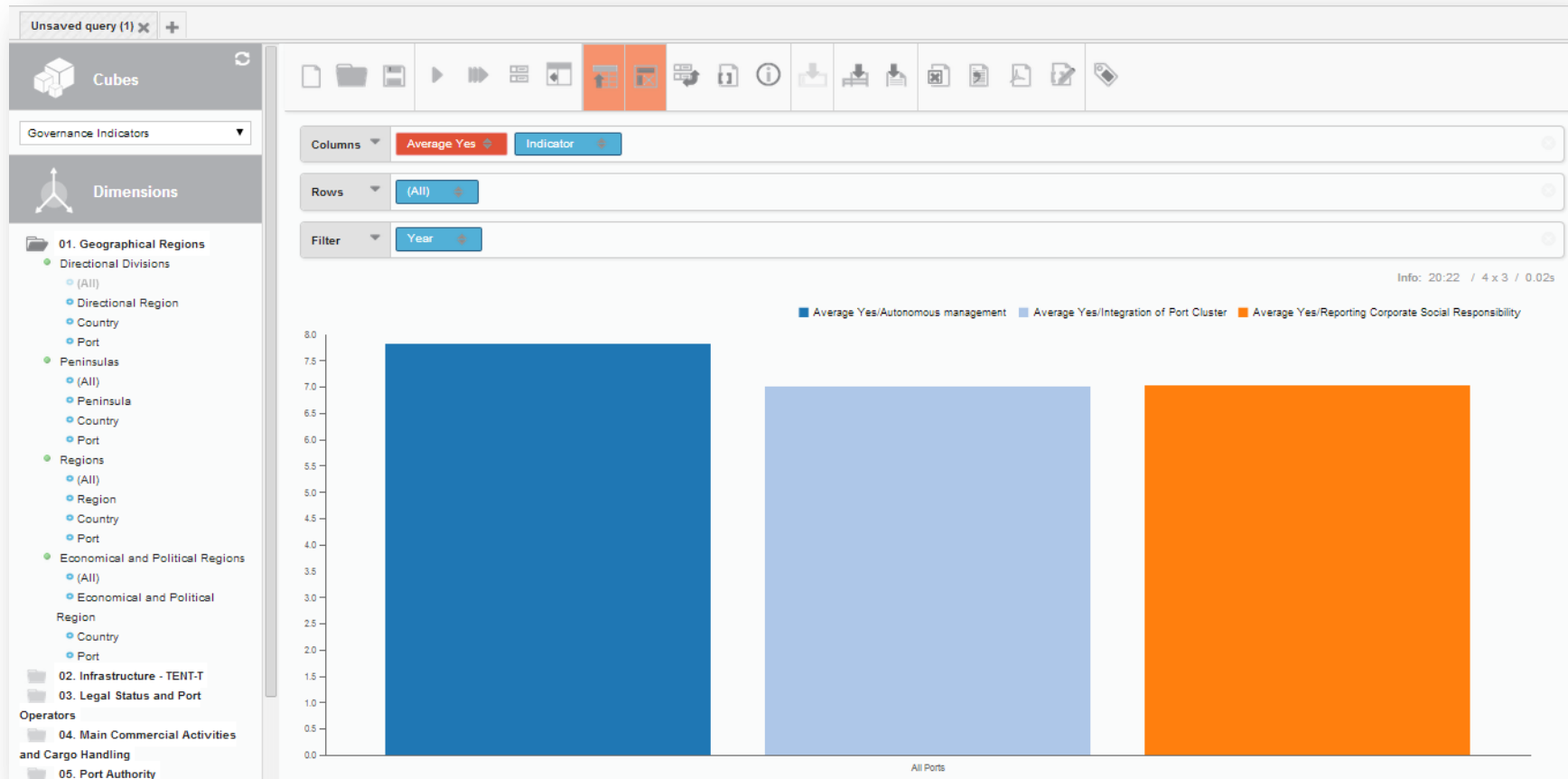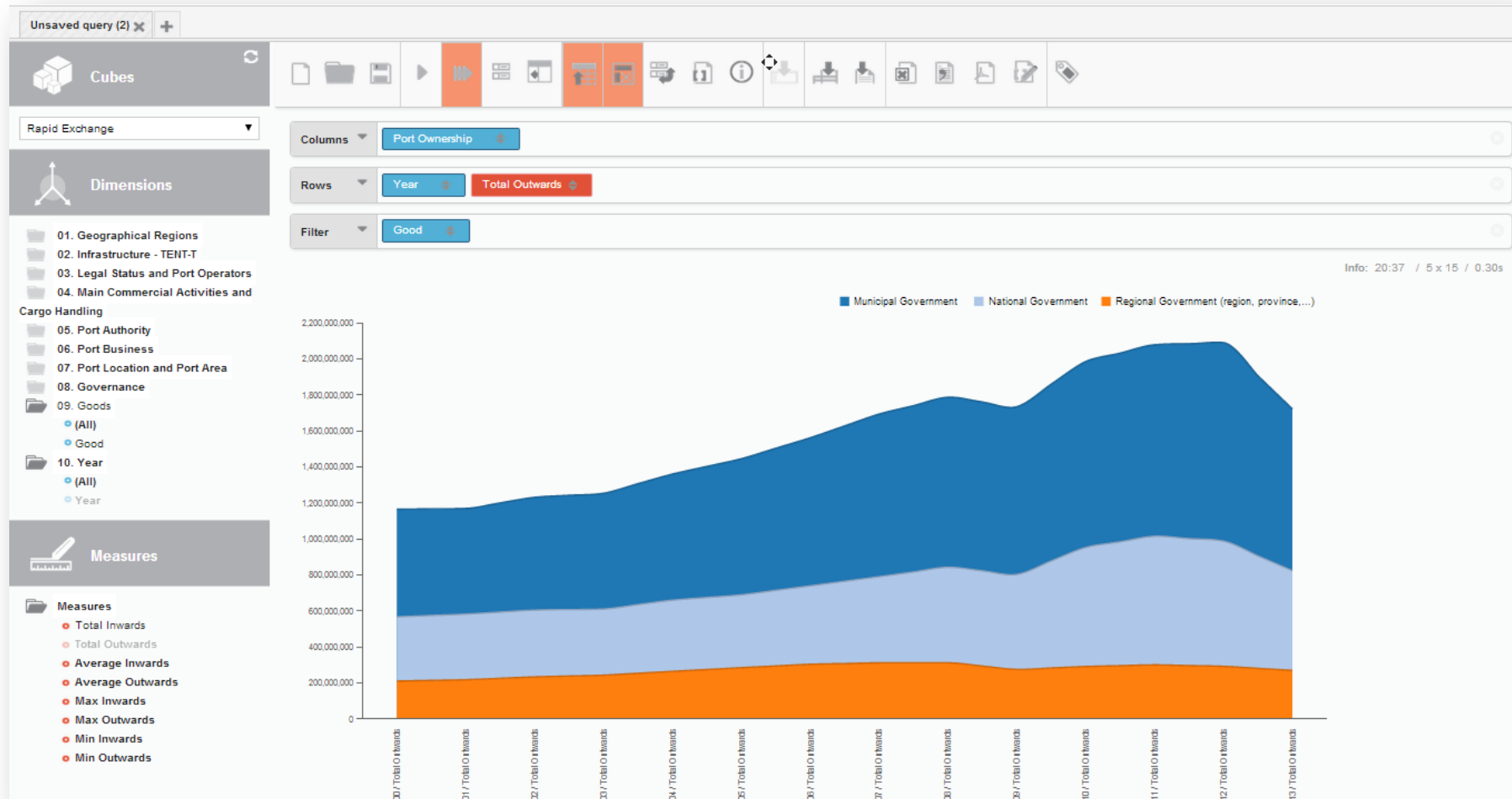
Governance Indicators
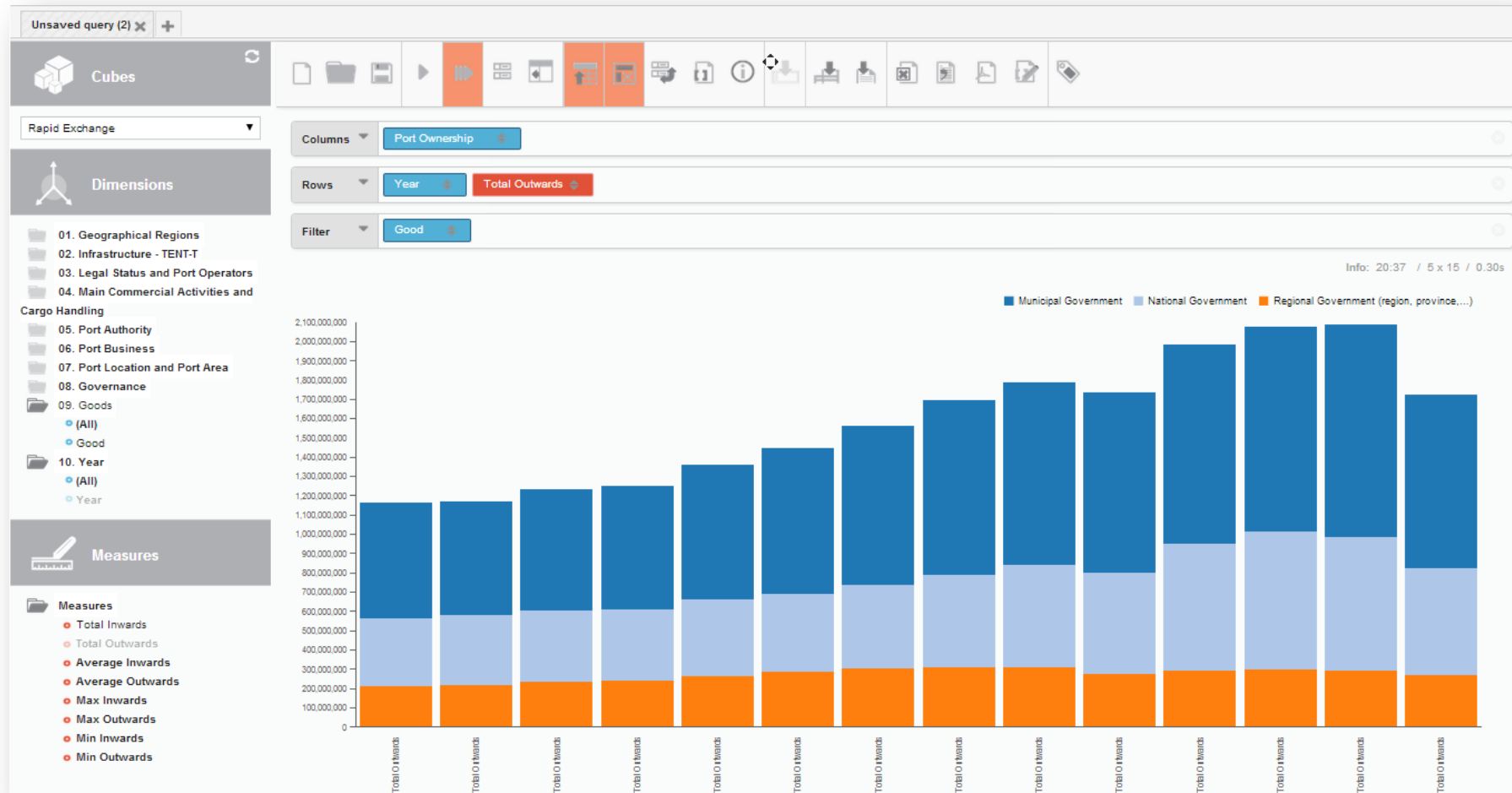
DATA ANALYSIS MODULE

Rapid Exchange System aggregated analysis
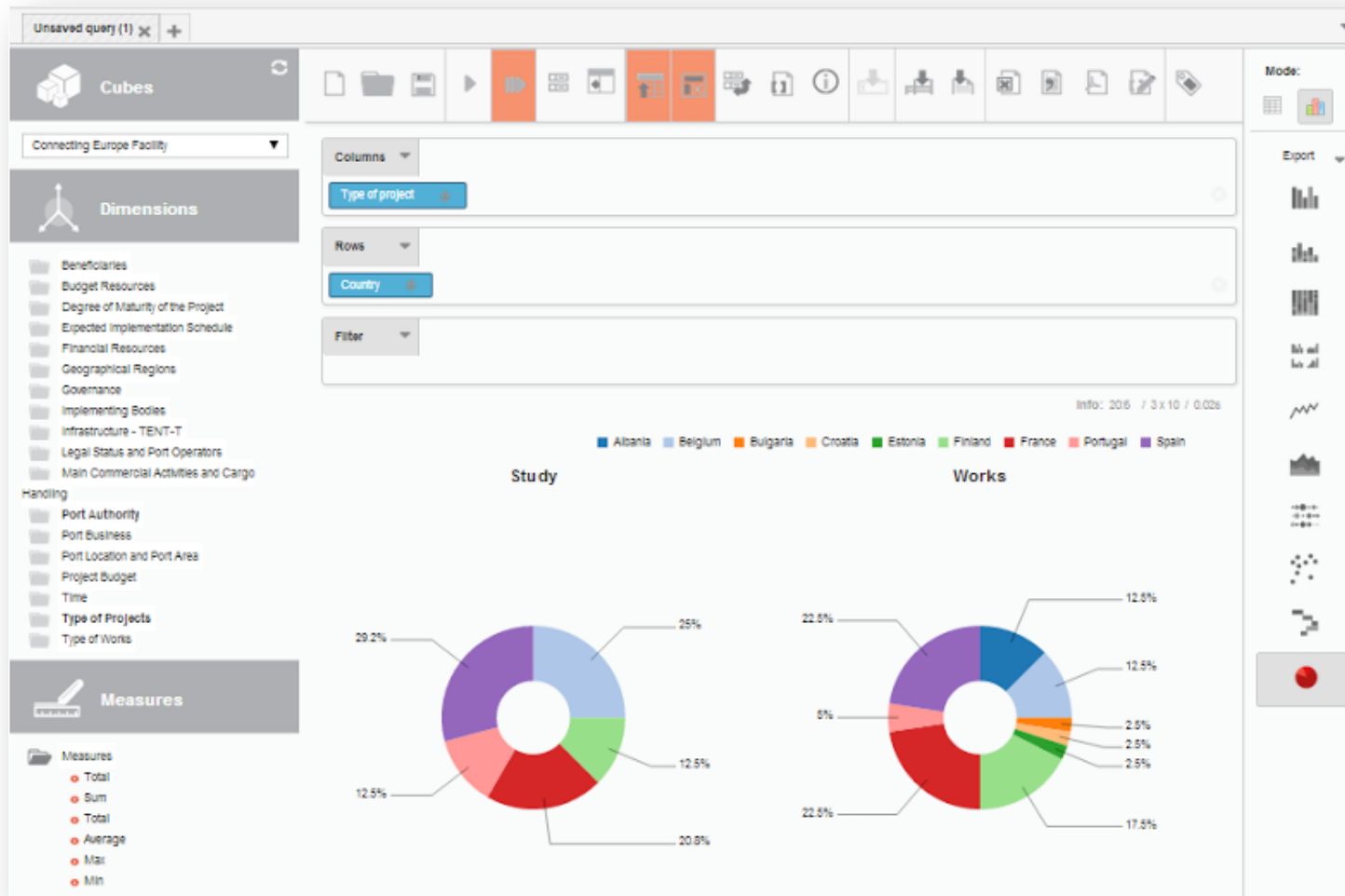
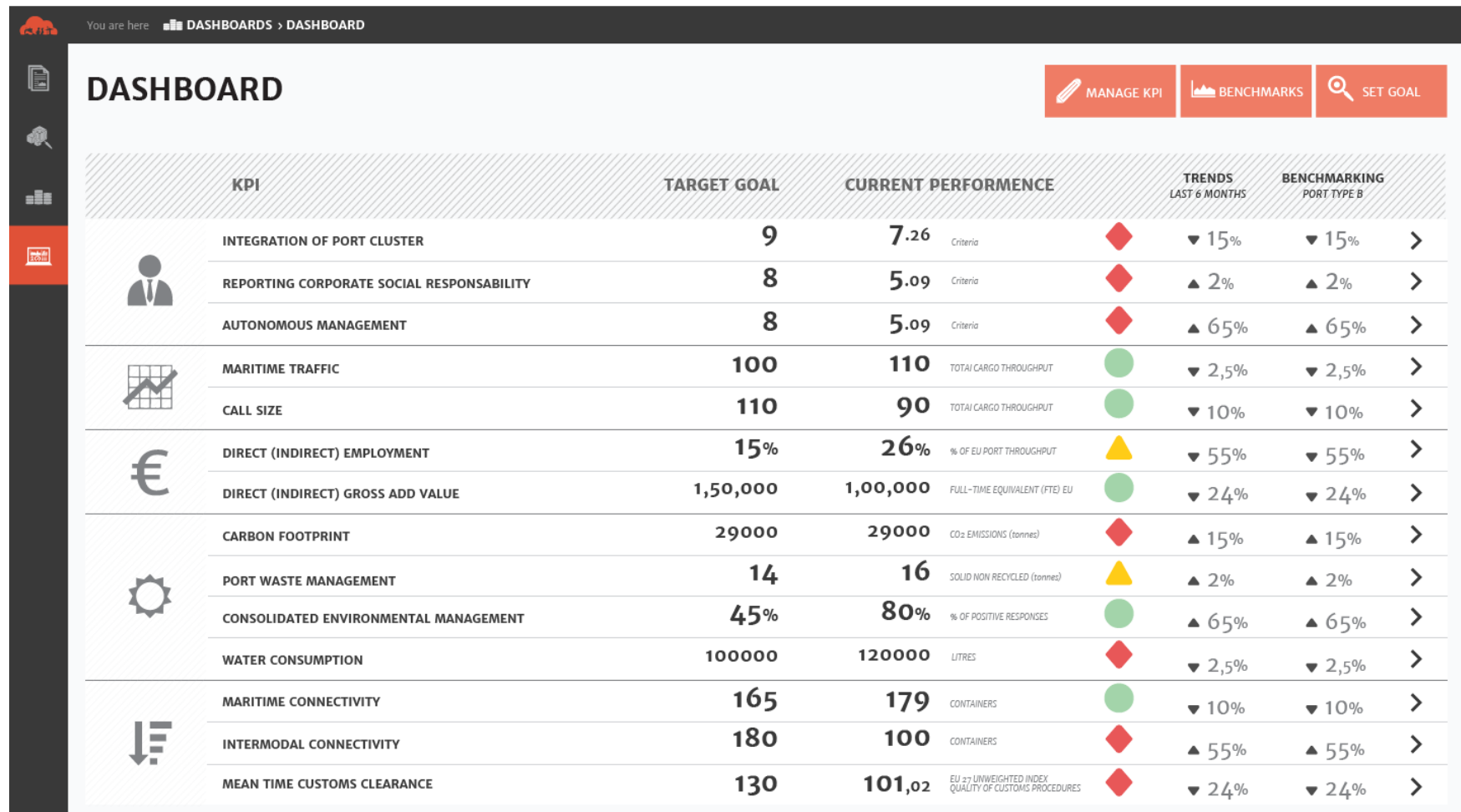# DATA ANALYSIS MODULE

Rapid Exchange System aggregated analysis
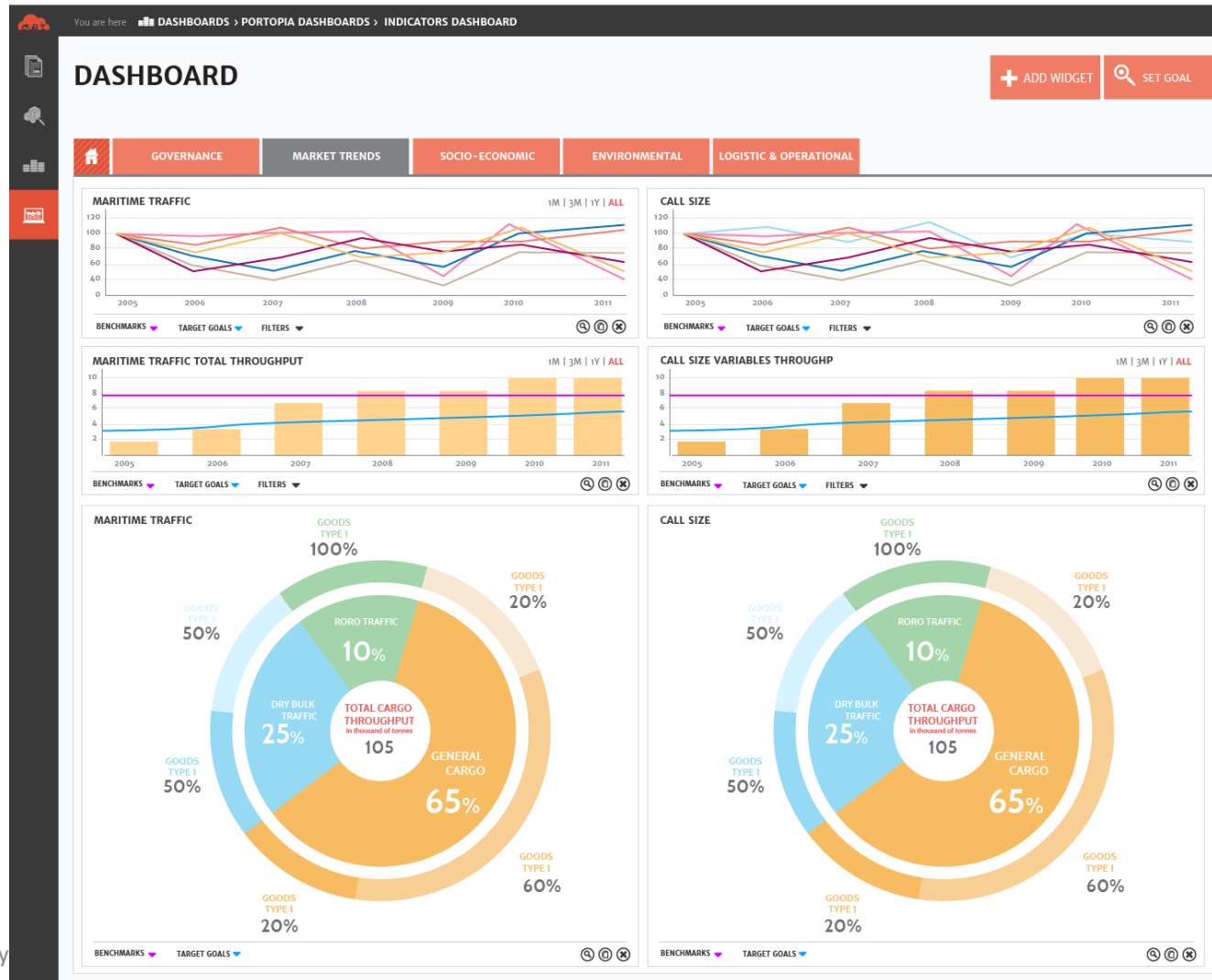
INTERACTION

CEF Projects analysis

Dashboard example (1)

DASHBOARD

MANAGE KPI   BENCHMARKS   SET GOAL

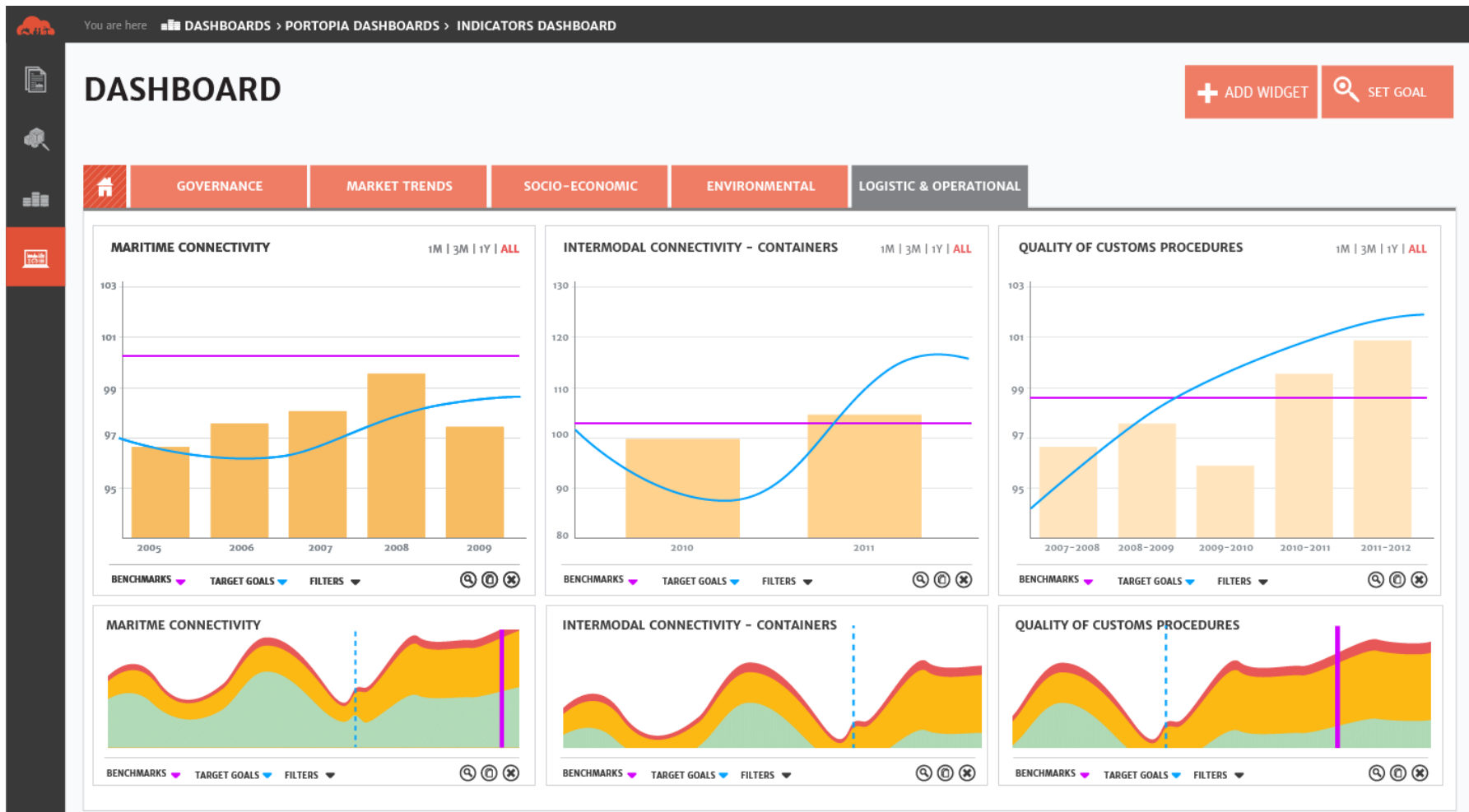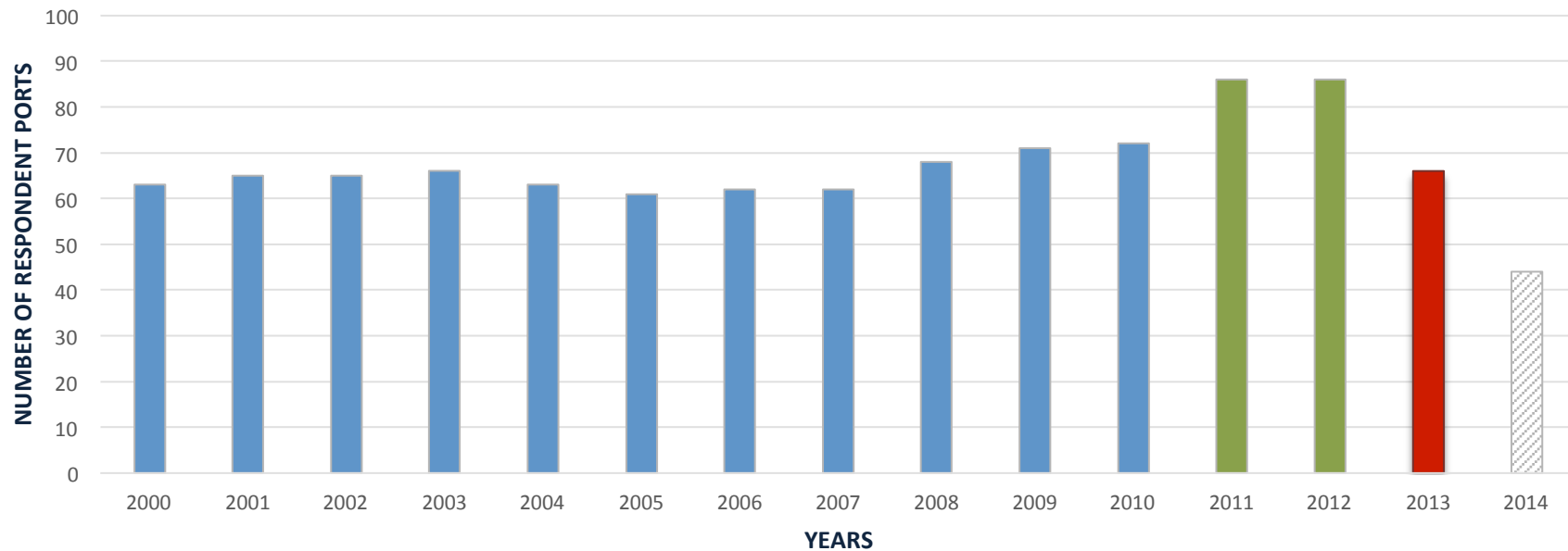| KPI	TARGET GOAL	CURRENT PERFORMANCE			TRENDS LAST 6 MONTHS	BENCHMARKING PORT TYPE B	
INTEGRATION OF PORT CLUSTER	9	7.26	Criteria	🔴	▼ 15%	▼ 15%	›
REPORTING CORPORATE SOCIAL RESPONSABILITY	8	5.09	Criteria	🔴	▲ 2%	▲ 2%	›
AUTONOMOUS MANAGEMENT	8	5.09	Criteria	🔴	▲ 65%	▲ 65%	›
MARITIME TRAFFIC	100	110	TOTAl CARGO THROUGHPUT	🟢	▼ 2,5%	▼ 2,5%	›
CALL SIZE	110	90	TOTAl CARGO THROUGHPUT	🟢	▼ 10%	▼ 10%	›
DIRECT (INDIRECT) EMPLOYMENT	15%	26%	% OF EU PORT THROUGHPUT	🟡	▼ 55%	▼ 55%	›
DIRECT (INDIRECT) GROSS ADD VALUE	1,50,000	1,00,000	FULL-TIME EQUIVALENT (FTE) EU	🟢	▼ 24%	▼ 24%	›
CARBON FOOTPRINT	29000	29000	CO₂ EMISSIONS (tonnes)	🔴	▲ 15%	▲ 15%	›
PORT WASTE MANAGEMENT	14	16	SOLID NON RECYCLED (tonnes)	🟡	▲ 2%	▲ 2%	›
CONSOLIDATED ENVIRONMENTAL MANAGEMENT	45%	80%	% OF POSITIVE RESPONSES	🟢	▲ 65%	▲ 65%	›
WATER CONSUMPTION	100000	120000	LITRES	🔴	▼ 2,5%	▼ 2,5%	›
MARITIME CONNECTIVITY	165	179	CONTAINERS	🟢	▼ 10%	▼ 10%	›
INTERMODAL CONNECTIVITY	180	100	CONTAINERS	🔴	▲ 55%	▲ 55%	›
MEAN TIME CUSTOMS CLEARANCE	130	101,02	EU 27 UNWEIGHTED INDEX QUALITY OF CUSTOMS PROCEDURES	🔴	▼ 24%	▼ 24%	›

Dashboard example (2)

Dashboard example (3)

RAPID EXCHANGE SYSTEM
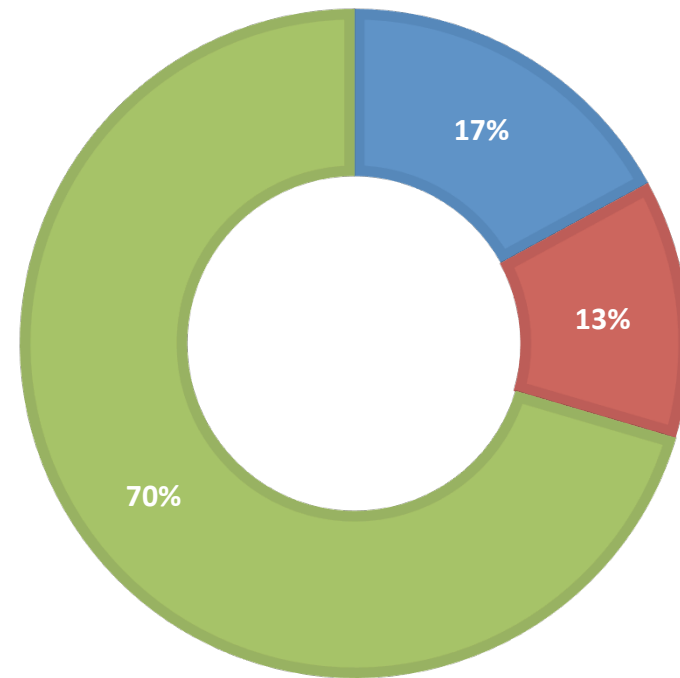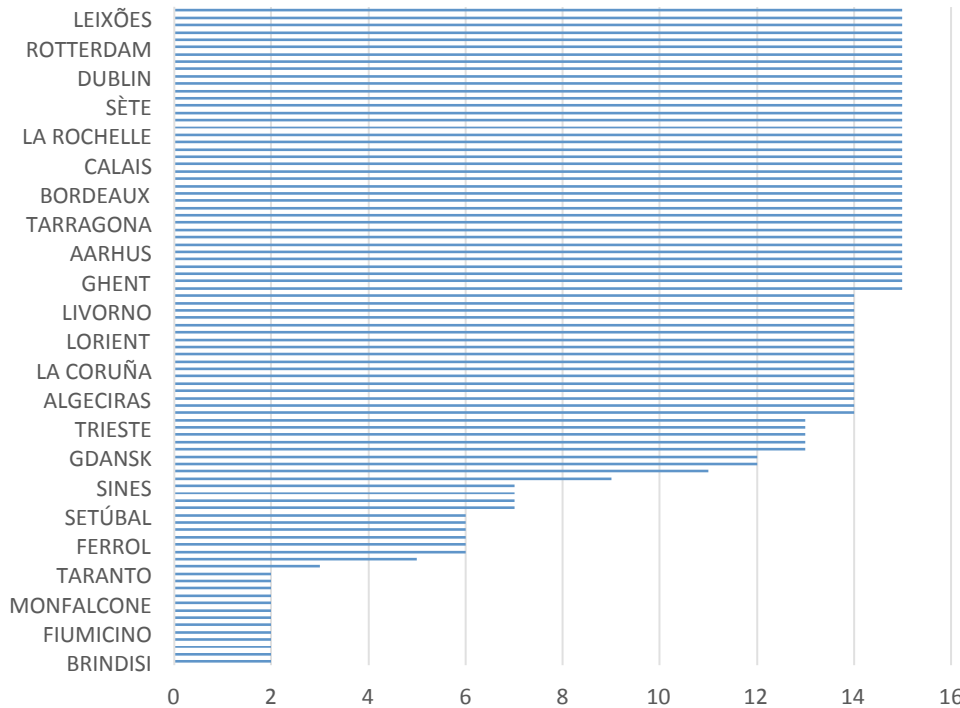
The evolution of participation

REMARKS

- *In **2011 and 2012** RES reached its peak with **86 respondent ports.***
- *However, in **2013** there was a **24% drop** on the number of respondent ports.*

RAPID EXCHANGE SYSTEM
Level of Constancy

REMARKS

- *30% of the ports have contributed with less than 10 years* for the RES data series. Furthermore, *there were detected a lot of data fragments and errors throughout the years.*

DATA ERRORS AND FRAGMENTS

RAPID EXCHANGE SYSTEM

What are the data errors found?

YEAR	QUATER	NAME OF THE PORT	TYPE OF GOODS	DIRECTION	VALUE
2004	Q1	SPECIME PORT	Ores	Inwards	1 609 000
2004	Q1+Q2	SPECIME PORT	Ores	Inwards	**231 000**
2004	Q1+Q2+Q3	SPECIME PORT	Ores	Inwards	4 500 000
2004	Q1+Q2+Q3+Q4	SPECIME PORT	Ores	Inwards	6 177 000

EXAMPLE OF DETECTED ERROR
- (Q1+Q2) < Q1

CONSEQUENCES
- Q2 = (Q1+Q2) – Q1   =>   Q2 = 2000 – 5000 = **-3000 ???!!!**

REMARKS
- **The methodology based in accumulated quarterly data leads to major errors!**

RAPID EXCHANGE SYSTEM

Data fragments

YEAR	QUATER	NAME OF THE PORT	TYPE OF GOODS	DIRECTION	VALUE
2000	Q1	SPECIME PORT	Number of containers	Inwards	
2000	Q1+Q2	SPECIME PORT	Number of containers	Inwards	668 141
2000	Q1+Q2+Q3	SPECIME PORT	Number of containers	Inwards	1 010 551
2000	Q1+Q2+Q3+Q4	SPECIME PORT	Number of containers	Inwards	1 355 741

HOW DO WE CALCULATE Q2 DATA

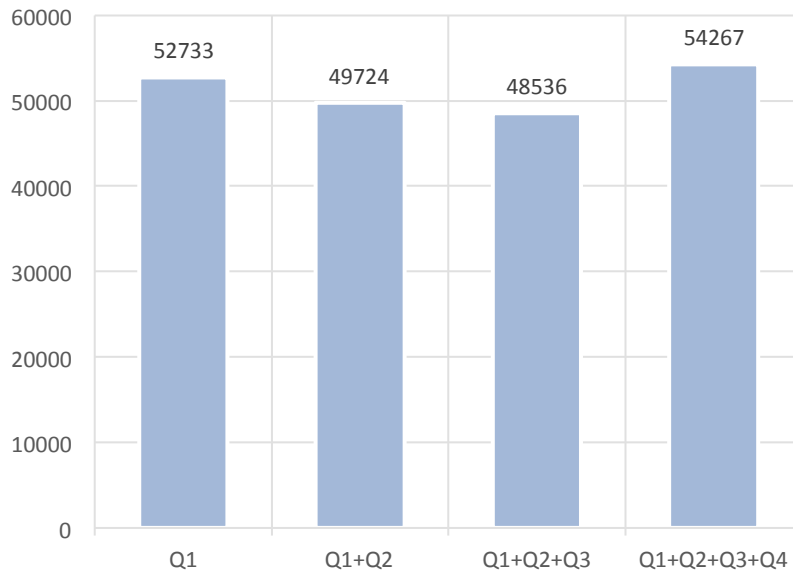- Q2 = (Q1+Q2) – (Q1) ...

REMARKS

- *Using the previous example, the individual values of the second quarter cannot be calculated in a reliable way, **leading us to an inconsistencies snow ball.***
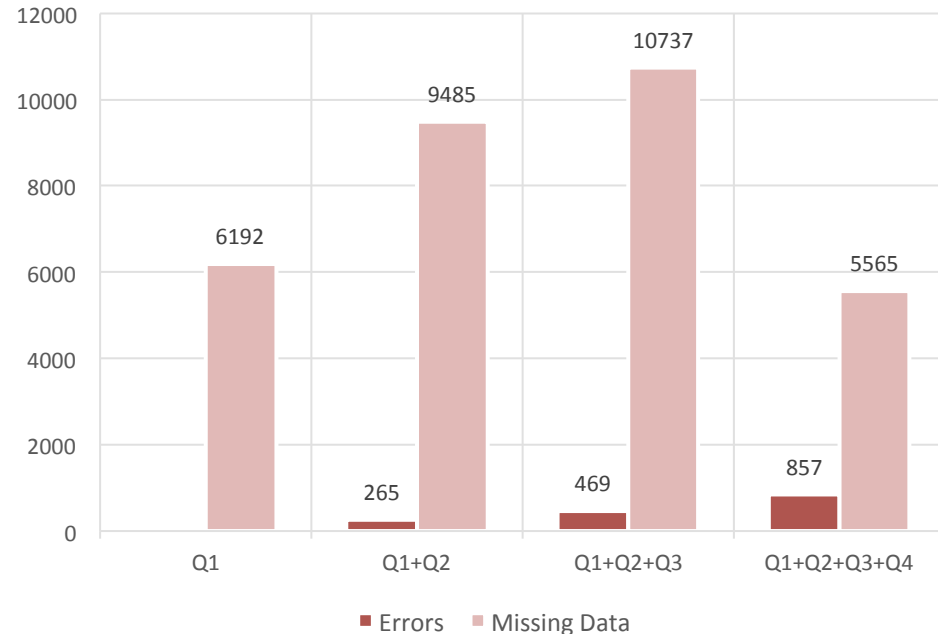
RAPID EXCHANGE SYSTEM

Quarterly data quality analysis

Data provided per quarter

Data inconsistencies

- Errors
- Missing Data

REMARKS

There is a significant lack of data quality due to:

- *Second and third quarters have less data provided;*
- *The number of errors increases on the quarterly bases.*

35

Next steps

By end of December 2014

- Implementation of new RES dashboard and user interface, short-term forecasting module

- Implementation of connectivity indicators

- Harmonized method for socio-economic impact calculation

- Leverage ECOPORTS data; CO2, waste, water quality footprint tool

- New , dynamic governance indicators

- Validation of an approach for user perception measurement

PORTOPIA

Industry and Science Participation

- Consisting of:
    - Universities and research institutes
    - European Seaports Organisation (ESPO) as formal partner
    - Credible, Euronext listed company (Glintt Inov) as ICT partner, supported by Marintek (Shipping KPI project)
- Main port industry stakeholder branch organizations as formal associated partners
    - As members of an Industry Stakeholder Advisory Committee (ISAC) for steering and validation of PORTOPIA's indicator development, validation and implementation.
    - As contributors by opening their networks and facilitating their member's contributions to PORTOPIA
- Global Scientific Committee (GSC) with participation from UNCTAD, OECD, WEF and selected academics

PORTOPIA

Benefits for Port Authorities

- Some port authorities may not possess adequate slack resources to engage in performance management.
  - PORTOPIA could serve as the performance management toolkit these ports need by offering them products and services they can effortlessly derive from the PORTOPIA-tool (e.g. **standardized sustainability reports**)
  - PORTOPIA will search for **complementarities with individual port performance management** systems, including sound integration
- Efficiency gains through the creation of user accounts
  - **Avoid repetitive input of basic data** in surveys and questionnaires
  - Updates when necessary
  - Interoperability with other systems / projects / databases
- **Strengthen the industry's position** and its members **in discussion with other stakeholders** (interest groups, policy makers,…)

PORTOPIA

Benefits for stakeholders

- Provide port industry stakeholders (shipping lines, terminal operators, shippers, ancillary service providers, other users) with a **one-stop-shop for port performance data**

- Allow stakeholders to **link their existing data** in an efficient and meaningful way to the PORTOPIA port performance database (while securing **data confidentiality**)

- Provide data management solutions to administer port service performance (cfr. user perception measurement tool) **to jointly improve the competitiveness of the whole industry** (port value chain approach)

- **Enhance the exchange of knowledge and experience between stakeholders** and provide appropriate educational and training support services

- **Individualized approach** towards stakeholders to cater for their needs

PORTOPIA

Why?

- **Today's (inconvenient) reality**:
    - **Increasing stakeholder pressure** to report in a transparent and neutral manner on various domains of individual and industry performance
    - Given the large amount of data available, **stakeholders increasingly take own initiatives** to collect data and start to draw up own reports to influence industries and policy makers
    - **Private consultants are setting up seed funds** (up to 100 million USD) to collect 'big data' on specific industries (energy, healthcare, telecom already under way)
    - **Significant threat** that port authorities and their stakeholders will be increasingly on the **defensive/reactive end** within discussions on their performance
- PORTOPIA offers the opportunity for the port industry to **keep performance reporting in a proactive manner under the full industry's control** as the end result should be an **independent organization managed / supervised by the industry** delivering value for all stakeholders

PORTOPIA

The INDEPENDENT

KPMG breaks new ground with launch of $100m technology fund

Mark Leftly

Monday, 11 November 2013

KPMG has stolen a march on its 'Big Four' rivals with the launch of what is thought to be the first significant investment fund established by any of the major accountants.

It is understood that KPMG senior partner Simon Collins has authorised an initial $100m (£74.8m) to be poured into a fund dedicated to investing in data and analytics businesses.

PORTOPIA opportunities & alternatives

| OPPORTUNITY	ALTERNATIVE
Keep control over individual data	Private consultants setting up databases
Inform the EC and other stakeholders out of PORTOPIA: strengthen the relationship with and between stakeholders on port policy	EC performing ad-hoc studies, deepening divide between stakeholders and creating unnecessary and inappropriate regulation
Efficient data collection / cost reduction: data stored and accessible in one place	Repetitive input of identical data in various surveys, leading to data redundancy
Confidential data treatment – ports and contributors define the level of confidentiality	External stakeholders reporting on individual port performance
Provide links between performance domains / meaningful benchmarking and knowledge management (port strategy)	Partial approaches to port performance, weak or no link to port strategy, economic and technological context
Proactive stakeholder management: explain performance in a transparent/objective way	Defensive reactions against stakeholders in case of suboptimal performance
Provide standards for performance reporting of which all ports can benefit e.g. Sustainability report guidelines and templates, ICT platform	Non-standardized approaches leaving room for stakeholder controversy / others imposing standards

PORTOPIA

Perspectives and Conditions

- 6 Perspectives (+ inland ports, benchmarking and strategy map):
  - WP1: Market Trends and Structure Indicators
  - WP2: Socio Economic indicators
  - WP3: Environment and Safety Indicators
  - WP4: Logistics Chain and Operational Performance Indicators
  - WP5: Governance
  - WP6: Integrating Users' Perspectives in Port Performance Evaluation
- Conditions:
  - Data confidentiality
  - User-friendly and dynamic knowledge management tool
  - Stakeholder-oriented
  - Independent
  - Innovative
  - Self-sustaining
  - Efficient (data collection)

PORTOPIA overview
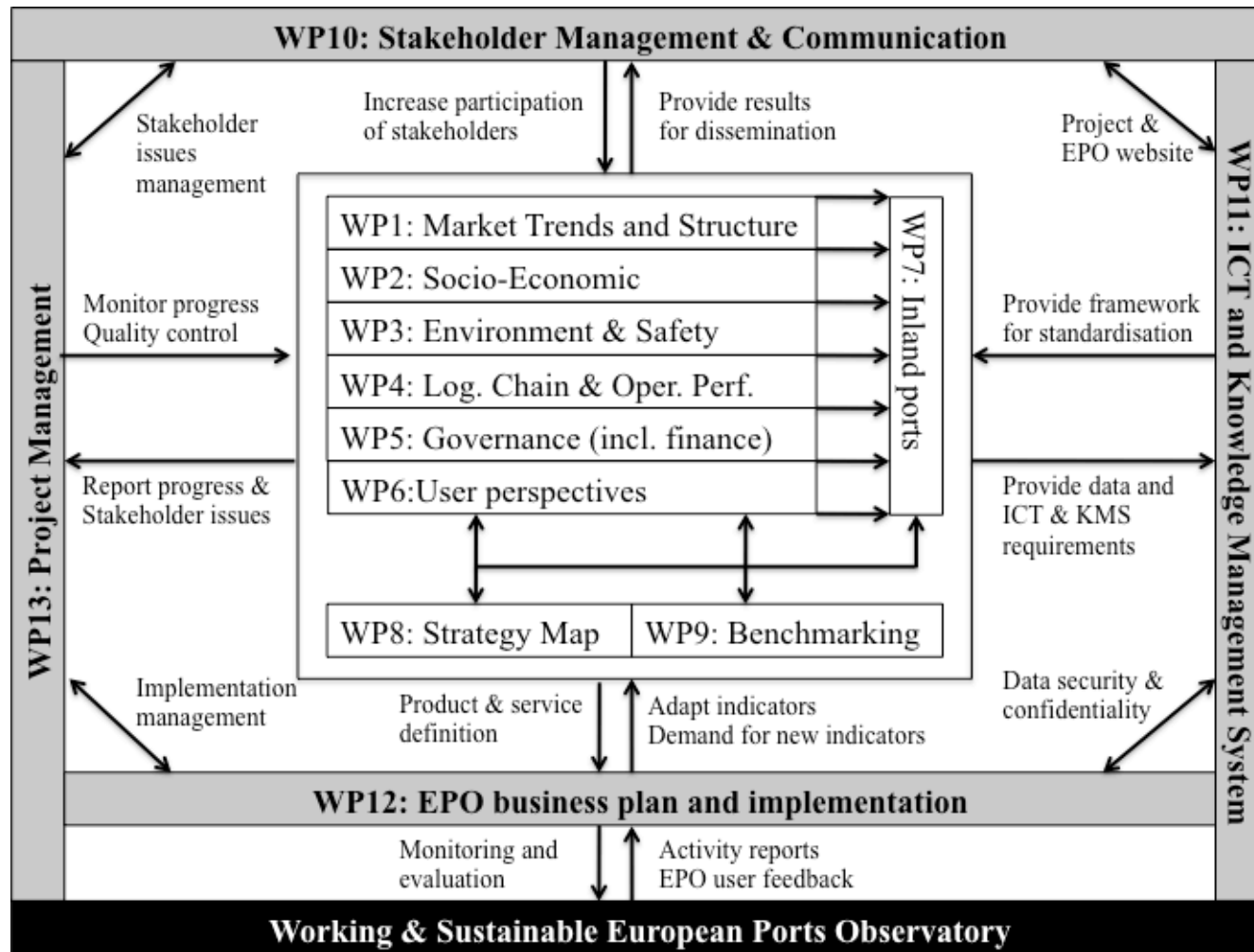
Timing and interactions
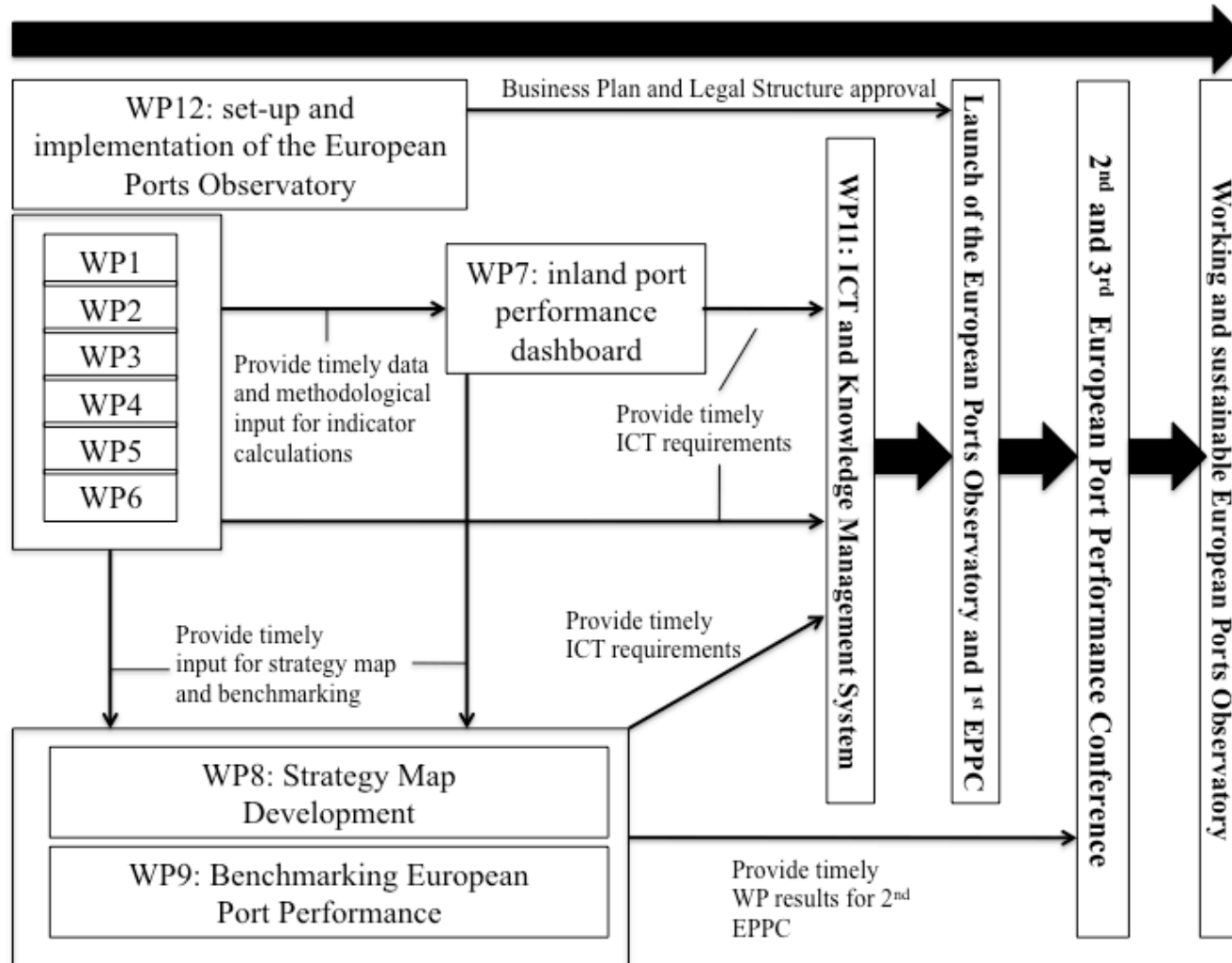
Challenges and risk

- Interaction academics / industry within a business intelligence project
  - Different profiles who do not understand each other interact to implement the project
    - **Need for "translators" who can bridge data, analytics and business decision making: data strategists, data scientists and analytic consultants**
  - Understanding transaction costs when implementing an indicator: acceptability also means a cost-efficient way to collect data
  - One by one indicator approach is difficult: create integrated dashboards
- Stakeholder management issues
  - Gain and maintain the trust of both industry and policy (government) stakeholders
  - Often divergent objectives
  - Data confidentiality issues
  - Implementation rhythm: take into account restricted absorptive capacity of stakeholders
  - Change management: cfr. changes in RES system (make the case for change)

SEVENTH FRAMEWORK PROGRAMME

Contact

- Prof. dr. Michaël Dooms – Project Director
- Michael.Dooms@vub.ac.be
- +32 2 629 21 30
- +32 477 606 132
- Skype michaeldooms
- Drs. Mychal Langenus – Project Manager
- Mychal.Langenus@vub.ac.be
- +32 2 629 20 35
- +32 498 13 99 10